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AUTHOR	Ohland, Matthew W., Ed.; Anderson, Tim J., Ed.
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ABSTRACT

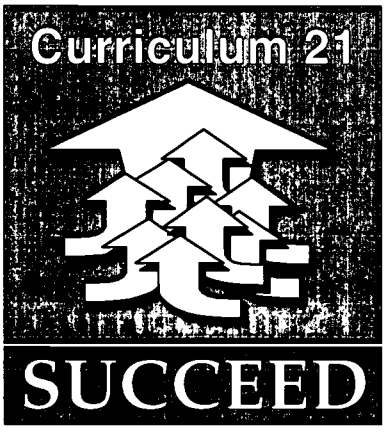
This document presents the Year 9 Annual Report of the Southeastern University and College Coalition for Engineering Education (SUCCEED). Contents include: (1) Executive Summary; (2) Response to Recommendations of Prior Review Teams; (3) Major Accomplishments; (4) Faculty Development; (5) Outcomes Assessment; (6) Student Transitions; (7) Technology-Based Curriculum Delivery; (8) Culture Change; (9) Assessment; (10) Industrial Involvement; and (11) Budget Information. Appendices include a glossary of acronyms and references. (Contains 147 references.) (YDS)

SUCCEED

SOUTHEASTERN UNIVERSITY AND COLLEGE COALITION FOR ENGINEERING EDUCATION

Year 9 Annual Report

April 30, 2001



An NSF Engineering Education Coalition

Clemson University - Florida A&M University - Florida State University
Georgia Institute of Technology - North Carolina A&T State University
North Carolina State University - University of Florida
University of North Carolina at Charlotte
Virginia Polytechnic Institute and State University

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A. Executive Summary

SUCCEED's vision that our most critical responsibility is the development of a cadre of faculty who are engineering education innovators has not changed. Many of our loftiest goals, such as the recasting of tenure and promotion criteria to give adequate recognition to educational scholarship, depend on the growth of the educational research community within engineering. We proudly report gains in this area in the section on Culture Change. We are confident that, partly due to our efforts, the engineering education research community has strengthened in the past decade. The improvement in quality and quantity of educational scholarship in engineering is clear from review of the Journal of Engineering Education and various conference proceedings, most notably those of the American Society of Engineering Education. In this report, we pay special attention to a number of ways we observe that community of innovators developing within SUCCEED.

In addition to the qualitative changes we observe more closely later in this report, quantitative measures also point to the growth of this community. Authors from SUCCEED Institutions contributed 14 articles to the Journal of Engineering Education in the past year (up from 6 last year). Another measure is the ability of SUCCEED faculty to obtain other funding for their educational research—over $20 million in grants or endowments for educational research has already been identified from industrial, government, or foundation sources (~$3.5 million from non-governmental sources); the acceleration of this success in recent years is noticeable. Another $2,940,600 has been given by industrial concerns as cash or in-kind contributions in situations where a return is expected (e.g., design projects with deliverables). In addition to cash support, students on such projects commonly work with a liaison provided by the company—a significant value that has not been estimated in these figures. While some of this support is difficult to document, the significant amount noted is a clear indication of lasting change.

A comprehensive marketing plan is helping take SUCCEED's message across the country. By redesigning SUCCEED's website to be database driven, it has become a national resource for a wide variety of engineering education innovation. The website is an integral part of the marketing plan, and a new CD-ROM for distribution has the same new look—this CD ROM will be distributed to the nation's engineering deans, and is responsive to their needs as assessed by a market survey. This market survey helped SUCCEED identify both the *types* of innovation most in demand and the *market channels* through which schools would be receptive to that innovation. As a result, SUCCEED is more market driven, permitting greater clarity than ever before in making funding decisions for the remainder of the award. The subtle changes in organizational structure that have facilitated this transition are addressed in SUCCEED's updated Strategic Plan.

SUCCEED's community of engineering education researchers is improving the United States engineering education system in exciting ways. Our comprehensive approach to engineering education innovation, driven by enhanced dissemination and assessment efforts, is expected to have a significant and lasting impact on the nation's engineering education system.

B. Response to Recommendations of Prior Review Teams

Since the NSF issued no recommendations after the submission of our previous annual report, this report will focus on our response to recommendations from SUCCEED's External Advisory Board based on a review of the Coalition's plans on March 21, 2001. A preliminary set of responses is outlined below (responses are in italics).

- The Board strongly supports the concept of an Engineering Faculty Development Institute. *Key SUCCEED personnel are identifying sources of support for this initiative. A draft white paper has been written and will be finalized for communicating the concept to potential supporters.*
- The Board also recommends that SUCCEED pursue the development of a Digital Library to serve as a repository of best products and best practices for improving engineering education. However, the Board is concerned about funding the web site, maintaining current information, connecting to other coalitions and the existence of multiple libraries. The Board strongly feels that SUCCEED should develop a robust business plan before embarking on this major commitment to future resources. *The EAB's advice in this endeavor will steer the planning of this effort, which is already underway. A response to the NSF call for proposals on digital libraries will be developed.*
- The Board strongly suggests that SUCCEED focus on possibilities for working with professional societies to help in these dissemination efforts. *Dissemination team efforts will be directed toward a presence at the national meetings of the professional societies. We are pleased to receive the EAB's endorsement of our plan, which we feel will reach the large number of faculty who do not attend the ASEE / FIE conferences. A No-Cost Extension will be sought to permit time to access multiple conferences.*
- The Board also recommends that SUCCEED focus its remaining assessment efforts on producing a summative assessment of all aspects of SUCCEED activities over the last ten years, including the specific work on outcomes assessment that has been an important aspect of SUCCEED's efforts. *A summative assessment of SUCCEED is in progress. We will attempt to track the progress of our students after graduation in order to assess the full impact of SUCCEED.*
- The Board encourages continued use of professional marketing expertise as part of the overall plan for ensuring successful dissemination of its products and services. The Board also recommends that SUCCEED expand their marketing targets to include key constituencies such as institutional leaders and legislators. *We appreciate the EAB's endorsement of recent marketing activities. SUCCEED's plans have always included institutional leaders in our target market, but we agree that marketing to legislators has significant potential to improve the condition of the engineering education community. It may also be useful to inform the upper administrators and development officers of SUCCEED's accomplishments.*
- The Board recommends that SUCCEED develop a set of case studies describing the activities of the SUCCEED schools, and that this compilation be distributed to Deans of Engineering schools. *Sarah Rajala of NC State has developed a case study of comprehensive engineering education reform using results from the Longitudinal Database. It is hoped to serve as a model for similar case studies of other institutions.*
- The Board recommends that SUCCEED explore additional opportunities for inter-coalition efforts during the next year as part of developing a plan for life after SUCCEED. *We will continue to seek opportunities for collaboration with the coalitions. Specifically, the annual conference will continue to be jointly sponsored, and reaching out to the community through workshops is planned.*
- The Board encourages the NSF to work with SUCCEED to help ensure an appropriate and effective closure to NSF funding. *SUCCEED is developing plans for a no-cost extension to maximize our legacy and ability to assess and disseminate our efforts.*

C. Major Accomplishments

SUCCEED has had another very successful year, yielding a wide range of accomplishments across all of our functional teams. We have updated a list of follow-on funding obtained by SUCCEED investigators to continue or extend their work—the list continues to be impressive. Also among the notable accomplishments is the progress we have made toward our milestone of 60% participation in faculty development.

> ***"This project adapts processes developed and disseminated by the SUCCEED Engineering Coalition and others which focus on stimulating student learning... In particular, the SUCCEED Vertically Integrated Design project at Virginia Tech was used as the basis for this project."***
> *–from NSF Award Abstract # 9950411, "Interdisciplinary Laboratory in Advanced Materials-A Team-Oriented Inquiry-Based Approach" awarded to Tennessee Tech*

Marc Hoit of the University of Florida took on the challenge of converting SUCCEED's website to the new format, working with marketing a firm chosen by the dissemination team; the website was brought on line March 18th (www.succeednow.org). The entire website is database driven; the data will be refined and access sped up. Continuous effort is required to maintain the web, respond to requests and continue to collect, convert and develop material to keep content of website current. Since the maintenance of such a website as a resource will require ongoing resources, a Digital Library proposal to NSF has been submitted in conjunction with Columbia University and other coalitions. The objective will be to expand the website to the other coalitions is being completed. Hoit was also charged with maintaining and updating SUCCEED's traveling booth display.

Carl Zorowski led the development of a Coalition wide dissemination plan that is now being implemented.[1] The development was initiated with a study carried out to determine the percentage of engineering students of the total national enrollment that could be potentially impacted by working with different sets of school with given levels of minimum enrollments. An email survey of Deans of Engineering was conducted nationally to obtain input on the products and processes that their institutions would have an interest in. A short market survey was sent by email during the summer of 2000 to 212 deans of ABET accredited colleges that are not associated with any coalition and for whom contact information was available. Responses were received from more than half of the schools, most directly from the Dean personally. Preliminary results indicate that at least half of the deans were interested in all but a few of SUCCEED's innovations.[2] Attendees at the Share the Future II multi-Coalition Conference witnessed the rollout of the new comprehensive marketing materials. The brochure/CD[3]/website and booth display were created with the assistance of a marketing services agency that has nearly finished its work. The brochure and CD will be mailed to deans and department chairs at all 300 colleges of engineering in the US this spring. The new materials are compelling and were well received. Plans for year 10 activities include presentations, workshops and displays at major disciplinary conferences and workshops to be held at Council of Schools sites.

Richard Felder and Rebecca Brent are well known for their extensive efforts in faculty development—particularly the Effective Teaching Workshop, which pre-dates the

SUCCEED Coalition. With the help of SUCCEED's financial and scholarly resources, however, the two have developed a number of new workshops and have begun to deliver them to a national and international audience. These new workshops, on topics such as Course and Curriculum Design/ Redesign,[4] Faculty Mentoring,[5,6] New Faculty Orientation Workshop,[7,8] Initiating and Maintaining an Engineering Faculty Development Program,[9,10,11] and Effective Teaching with Technology, have been (and continue to be) presented to a wide audience. In fact, in Years 6, 7, 8, and 9 of SUCCEED (the years since the second SUCCEED Cooperative Agreement), Richard Felder has presented or scheduled 159 workshops, papers, or invited lectures on the subject of their SUCCEED work—frequently in collaboration with Rebecca Brent.[12] As a result, they serve as a traveling sales force marketing the quality of SUCCEED's work. A lynchpin of our dissemination activity has been an effort to help experts in other areas to become established in a similar way.

One of the more important measures of SUCCEED's impact is the number of students who are in some way reached by our innovations. With the scale-up of so many of SUCCEED's freshman-year innovations, our innovations are now having an affect on the education on each engineering student at a SUCCEED school—a number that amounts to 1/8 of the nation's production of engineers. The "First Year Program" (FYP) at FAMU-FSU is one of the newer scale-ups, with over 100 students in EGN 1004L – First Year Engineering Lab (1 Credit Hour) in Spring 2001. EGN 1004L is being team-taught by six (6) senior faculty, including Dean Chen, Associate Dean Awoniyi, Mike Peters (ChE Dept Chair), Tom Harrison (Past EE Dept Chair) and Kamal Tawfiq (Associate Chair of CE Dept). Plans are now underway to include a peer-mentoring component in the FYP. Details of the scale-up of other efforts are reported in the Student Transitions section.

Multidisciplinary design is still a strength at SUCCEED institutions. The cumulative effect of the University of Florida's Integrated Product and Process Design program is staggering, and the FAMU-FSU College of Engineering Multidisciplinary Design and Training Clinic, under the direction of Yousef Haik, is now firmly rooted in the curriculum of each of the College's departments.

A $500,000 gift endowed NC State's Engineering Entrepreneurial Program.[13] The gift was given by a 1995 NC State alumnus who participated in the program for seven semesters, and went on to retire from his first entrepreneurial venture as a 27-year-old millionaire. In addition to his monetary support, the alumnus will contribute to the program as an advisor and a lecturer based on his entrepreneurial experiences.

TIME Magazine selected Clemson University as among four colleges and universities named "College of the Year" in its 2001 edition of "The Best College for You," an annual college guide issue. The editors focused on colleges and universities that do an exceptional job of teaching writing and communications skills. Clemson was spotlighted as being "on the cutting edge of the communication-across-the-curriculum (CAC) movement," in which faculty integrate not only writing, but also oral, visual, and electronic communication in all disciplines, according to a news release from TIME. Central to the honor is the work of Art Young, the Campbell Chair of Technical Communications, who has received support from

SUCCEED to study the special challenges of "writing across the curriculum" within the context of the engineering curriculum.[14]

NC State University's College of Engineering is one of 10 institutions honored by the National Science Foundation for mentoring ethnic minorities, women and people with disabilities in the fields of science, math and engineering. A $10,000 grant comes with winning a 2000 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring.[15] "The College of Engineering has, for several decades, kept as one of its top priorities the goal of increasing the number of women and under-represented minorities and implementing programs that nurture and guide them toward success," said Nino A. Masnari, the college's dean. "We are extremely pleased to receive this prestigious award recognizing these efforts." Other winners (past and current) have included SUCCEED institutions and faculty such as the Southeastern Consortium for Minorities in Engineering, headquartered at Georgia Tech,[16] and Sue Lasser of Clemson (Director of Programs for Educational Enrichment and Retention—PEER),[17] and Vallie Guthrie of North Carolina A&T.[18]

Other Funding for Educational Research

We have always recognized that a critical part of SUCCEED's legacy must be the development of a cadre of engineering faculty engaged in educational research and scholarship. SUCCEED is in the process of compiling an extensive publication list that will demonstrate the level to which we have established a community of scholarship. Another excellent measure of how we are achieving this objective is the amount of funding secured by SUCCEED investigators from other sources to continue or extend the educational research initiated with SUCCEED funding. It has always been difficult to document such successes, so the scope of this list is even more impressive.

Grant title and period	Agency, award	Principal Investigators	Support
"Engineering Fundamentals Curriculum Renewal," 2001	Student Engineers' Council	R.M. Goff, J. Connor, & S. York, Virginia Tech	$15,000
"Curriculum Integration Through The Virtual Enterprise" 3/2001-2/2004	NSF CCLI 0088816	Paul Stanfield, Bala Ram, Eui Park, Sanjiv Sarin, NC A&T	$74,699
"Georgia Tech Student and Teacher Enhancement Partnership (STEP) Program" 3/2001-4/2004	NSF DGE 0086420	Donna C. Llewellyn April S. Brown Marion Usselman, Georgia Tech	$1,496,635
"Pair-Learning in Undergrad. Comp. Sci. Education" 1/01-12/03	NSF DUE 0088178	Laurie Williams, North Carolina State University	$227,110
"Internet Based Curriculum Innovation in Information Engineering and E-Business," 12/00-11/03	NSF EEC 0080315	A.R. Pritchett, M.A. Iken, J.-C. Lu, R.G. Heikes, H.D. Ratliff, Georgia Tech	$499,993

Grant title and period	Agency, award	Principal Investigators	Support
"Presidential Awards For Excellence In Science, Mathematics and Engineering Mentoring"	NSF HRD 0003093	Vallie Guthrie, North Carolina A&T	$10,000
"Presidential Awards For Excellence In Science, Mathematics and Engineering Mentoring" Oct 2000-Sep 2002	NSF HRD 0003079	Sarah A. Rajala, North Carolina State University	$10,000
Endowment of NC State's Engineering Entrepreneurs Program,[19] 2000	Program alumnus Donald J. Barnes	Tom Miller, NC State	$500,000
"Creating Multi-disciplinary Curricular Paradigms: Bioprocessing / Chemical Engineering" August 2000-July 2003	NSF EEC 0080484	S.W. Peretti, D.P. Dannels, R.J. Spontak, C.M. Anson, C.R. Daubert, NC State University	$499,090
"Mechatronics Education Workshop" Aug 2000	NSF DUE 0001455	I. Charles Ume, Georgia Tech	$25,000
"U.S.-European Third Global Engineering Education Workshop, Aachen, Germany, October 18-20, 2000" August 2000-July 2002	NSF INT 0083982	Pamela F. Kurstedt, Virginia Tech	$50,000
"Integrative Graduate Education and Research Training in Advanced Networking" August 2000-July 2005	NSF DGE 9987586	Scott F. Midkiff, Marc Abrams, George E. Morgan, C. Patrick Koelling	$2,555,613
Summer Transition Pgm	Microsoft	Tony L. Mitchell	$4,000
"SCALE-UP (Student Centered Activities for Large Enrollment University Physics)" Jun 2000-Apr 2002	NSF DUE 9981107	Robert J. Beichner, John S. Risley, North Carolina State University	$395,252
"Development of Inter-disciplinary Courseware in Configuration Management" June 2000-April 2003	NSF DUE 9952277	Michael S. Leonard, Judith I. McKnew, Nagraj Balakrishnan, Clemson University	$75,000

Grant title and period	Agency, award	Principal Investigators	Support
"Undergraduate Research Experience in Biological Systems Engineering" May 2000-April 2005	NSF EEC 9912263	David H. Vaughan, Virginia Tech	$435,385
"Application of Hierarchical Cognitive Model to Education of Undergraduate Engineering Students"[20] May 2000-April 2003	NSF DUE 9952348	D. Hirt (PI), D. Bruce, C. Gooding, J. Haile, S. Husson, S. Kilbey, R. Rice, and D. Switzer, Clemson University	$349,550
"Hands-On and Early Design – Practical Engineering, Full Integration,"[21,22] 2000	Virginia Tech's Student Engineers' Council	R.M. Goff, M.H. Gregg, J.Connor, Virginia Tech	$12,000
"EMPACC (Engineering, Mathematics, Physics and Chemistry Coalition) Scholars Program"	Office of Naval Research	Eric A. Cheek (PI) and Caesar Jackson, NC A&T	$1,365,000
Online Degree program in Electrical Engineering	Sloan Foundation	Haniph Latchman, University of Florida	$135,000
ExCEEd—Excellence in Civil Engineering Education, 1999-2002	American Society for Civil Engineers	Marc I. Hoit, University of Florida	$300,000
"TALENT 21 - Gateway for Advancing Science and Mathematics Talent," Oct 1, 1999 - Sept 30, 2004	NSF HBCU-UP	C. Jackson, A. Titus, A. Kennedy, G. Tang, G. Scales, M. Smith, S. Sarin, A. Kurepa, NC A&T	$2,999,985
"Faculty for the Future Program"	General Electric Foundation	NC State College of Engineering	$150,000
UF minority student programs endowment	Lockheed-Martin	Jonathan F.K. Earle, University of Florida	$400,000
"Chemical engineering laboratory in electronic and Photonic devices," 1999	Dreyfus Foundation, SG-00-031	David F. Ollis, North Carolina State University	$30,000
NC State University Center for Minority Engineer Development	BP Amoco Foundation	Tony Mitchell, NC State	$150,000
Multidisciplinary / International project	Boeing	James Marchmann, III, Virginia Tech	$125,000

Grant title and period	Agency, award	Principal Investigators	Support
Virginia Tech Dissection Laboratory	Lockheed Martin +four companies	Richard M. Goff, Virginia Tech	$80,000 $48,000
Virginia Tech Advanced Student Project Laboratory	Joseph A. Ware (private donation)	College of Engineering, Virginia Tech	$600,000
Virginia Tech Virtual Corporations	Motorola Lockheed Martin Westinghouse		$50,000 $70,000 $60,000
"Collaborative Proposal: Duke-NCSU Teaching Fellows in Elementary Education Program" Sep 1999-Aug 2002	NSF GK-12 9979583	Laura Bottomley, NC State	$273,027
	Lucent Technologies Foundation	Laura Bottomley, NC State	$5,000
Freshman Project Lab	Raymond and Violet Frith (private donation)	College of Engineering, Virginia Tech	$250,000
"Changing the Faces of the Engineering and Science Professoriate," Oct 1998-Sep 2003	NSF HRD 9817632	G. Wayne Clough, Georgia Tech	$2,500,000
"Presidential Awards For Excellence In Science, Mathematics and Engineering Mentoring," 10/98-2/01	NSF HRD 9816097	Winser E. Alexander, North Carolina State University	$10,000
"Instrumentation and Laboratory Improvement" Aug 1998-Jul 2000	NSF DUE 9850620	John J. Hren, North Carolina State University	$68,541
"A Longitudinal Study of Programs at Eight Engineering Colleges using the SUCCEED Longitudinal Database," 8/1/98-7/31/00	NSF, DGE-9809663	Matthew W. Ohland, University of Florida	$102,000
"Freshman Practical Engineering Laboratory,"[23,24,25,26] 1998	Student Engineers' Council	M.H. Gregg, R.M. Goff, O.H. Griffin, P. Devens, Virginia Tech	$10,000

Grant title and period	Agency, award	Principal Investigators	Support
"Summer Research Experiences for Undergraduates in Mechanical Engineering" March 1998-March 2003	NSF EEC 9732322	John M. Kennedy, Clemson University	$324,250
"SCALE-UP (Student Centered Activities for Large Enrollment University Physics)" Jan 1998-Dec 1999	NSF DUE 9752313	Robert J. Beichner, John S. Risley, North Carolina State University	$174,890
"International Workshop on Engineering Education Reforms with Emphasis on Electric Power Systems" Oct 1997-Jan 1999	NSF ECS 9619220	Bernard E. La Berge, Lamine Mili, Leonard A. Ferrari Virginia Tech	$30,049
"Undergraduate Mechatronics Laboratory" Aug 1997-Jul 1999	NSF DUE 9751050	I. Charles Ume, Thomas G. Habetler, Georgia Tech	$86,583
"CRCD: Computer Simulation of Material-From Atomistic to the Continuum Level" June 1997-Aug 2000	NSF EEC 9700815	R. Kriz, J.K. Burton, D. Farkas, R.C. Batra, W.A. Curtin, Virginia Tech	$220,915
Virginia Tech ASPIRE '97	General Electric, Dow, DuPont Committee for Student Success	Bevlee Watford, Virginia Tech	$39,000
"Undergraduate Research Experience in Biological Systems Engineering" May 1997-August 2000	NSF EEC 9619732	David H. Vaughan, Virginia Tech	$207,000
"REU Site in Electrical / Computer Engineering" Jan 1997-Dec 1999	NSF EEC 9619401	Darren M. Dawson, Xiao-Bang Xu, Clemson University	$152,600
Migration of **SUCCEED** innovations to Brazil / other parts of Central and South America	Lucent Technologies	Haniph Latchman, University of Florida	$13,000
"A Conference for Engineering Education Program Grantees" Dec 1996-Nov 1997	NSF EEC 9700827	Robert J. Coleman, UNC Charlotte	$32,698

Grant title and period	Agency, award	Principal Investigators	Support
"Presidential Awards For Excellence In Science, Mathematics and Engineering Mentoring" Oct 1996-Sep 1998	NSF ESR 9612624	Susan J.S. Lasser, Clemson University	$10,000
"Presidential Awards For Excellence In Science, Mathematics and Engineering Mentoring" 10/96-9/98	NSF ESR 9612591	Howard G. Adams, Georgia Tech	$10,000
"Freshman Laboratory for Product and Process Engineering," 1996-1997	NSF, DUE-9559927	David F. Ollis, North Carolina State University	$200,000
"Hands-On Institute for Science and Technology," February, 1995	ASCE CEOP	Marc I. Hoit and Matthew W. Ohland, University of Florida	$3,200
Online Course Development	Virginia Tech Center for Innovation in Learning	Electrical and Computer Engineering faculty, Virginia Tech	$205,000
Horizontal Integration	US Army	Daniel P. Schrage, Georgia Tech	$1,000,000
Introduction to Engineering / Freshman Physics equipment grant	Hewlett-Packard	NC State	$250,757
College of Engineering Teaching Day	Alcoa	UNC Charlotte	$2,000
"Development of instructional systems for teaching an electricity and magnetism course for engineers," 3 years[27,28]	NSF, DUE-9455470	Edward Thomas, Georgia Tech	$242,000

Faculty Development Participation

As one of our key milestones, SUCCEED promised that we would engage 60% of our faculty in faculty development efforts. The continuation proposal review team viewed that target value with some concern that it was too high (as did some of us in SUCCEED). We are, in fact, rapidly closing in on our milestone of reaching 60% of engineering tenure-track faculty. Participation figures are available for all documented faculty development activities under the present cooperative agreement. Matthew Ohland, now of Clemson University, developed a database that cross-references all SUCCEED engineering faculty and all faculty

development events—such a comprehensive approach was necessary to prevent redundancy in counting faculty participation—we must be sure that we actually reach 60% of the faculty, not merely the usual 10% six times each. Current faculty development statistics are shown in the table below.

Note that, despite the fact that many faculty development events are not reported to SUCCEED, that most member schools have surpassed 50% already, and that Virginia Tech, through its innovative and highly successful 3-day summer Faculty Development Institute, we have documentation that indicates that more than 80% of its faculty has participated (the actual number is probably over 90%, by Virginia Tech's estimates). It should be noted that Georgia Tech reports statistics in the aggregate, so its statistics are not generated from the SUCCEED faculty participation database.

School	Participating Engineering Tenure-Track Faculty	Total Engineering Tenure-Track Faculty	Percentage
Clemson	72	135	53%
FAMU-FSU	44	77	57%
GT	166	376	44%
NCAT	37	74	50%
NCSU	128	221	58%
UF	136	298	46%
UNCC	56	97	58%
VT	240	291	82%
Totals	**879**	**1569**	**56%**

While Georgia Tech is still short of the 50% mark, it is impressive to note in the statistics kept by Nelson Baker that participation of the other colleges at the Institute show broad engagement of all Georgia Tech faculty:

College	Participating	Percentage	Total
College of Architecture	32	(68.1%)	47
College of Computing	53	(68.8%)	77
College of Engineering	166	(44.1%)	376
College of Management	22	(47.8%)	46
College of Liberal Arts	56	(49.1%)	114
College of Sciences	78	(42.6%)	183
Georgia Tech Total	**407**	**(48.3%)**	**843**

The University of Florida hosted a Visiting Scholars Workshop (Teaching and Learning in the Engineering Classroom) sponsored by the NSF. This on-site workshop for engineering educators was to improve faculty teaching by emphasizing student learning, active teaching techniques, presentation fundamentals, and class organization. The full workshop was done in two parts, one part in September 2000[29] and the other in February 2001,[30] in order to permit follow-up. The workshop included half-day classroom visits for those professors desiring a non-threatening, impartial, and confidential assessment of their teaching, followed

by a half-day of formal workshop activities. The afternoon formal workshop included a demonstration class as well as a focus on practical tips for enhancing teaching and learning.

D. Faculty Development

> ***"Yes, we are very much interested in partnering with you in the SUCCEED program. Please find our responses below. Please let me know if there is anything else that is needed from our end."***
> *– from a response to SUCCEED's market survey of US Engineering Deans*

Because the faculty of a university is one of the most important factors in creating an intellectually enriching environment for students and each other, the Georgia Tech College of Engineering recognizes the importance of the research and teaching development for faculty members through a Faculty Mentoring Award. This award recognizes as a team a Georgia Tech mentor and mentee who together have demonstrated an exemplary teaching and/or research mentoring partnership, and is given annually each spring consisting of $5,000 to be shared equally between the faculty members to enhance their teaching, research, and/or mentoring activities at Georgia Tech, and $5,000 to the school of the faculty recipients to be utilized to enhance faculty mentoring activities within the school. The College is committed to continuing this award.

Chick Glagola reports that at the University of Florida, the College of Engineering has committed to establishing a position of faculty development director within the College of Engineering. This College of Engineering committed its financial and administrative support for continuous and sustainable faculty development activities within the College.[31,32]

Siegfried Holzer reports planning the Y9 faculty development program with director of Virginia Tech's Center for Excellence in Undergraduate Teaching (CEUT). SUCCEED has developed a strong partnership with CEUT. Faculty development (FD) activities will be coordinated by a Faculty Fellow, appointed by the Dean, to replace the FD coordinator from SUCCEED and maintain the very active FD program after SUCCEED. A wide range of events is reported in the events table of the Major Accomplishments section. As a result of the very successful Faculty Development Institute, participation of engineering faculty in faculty development activities at Virginia Tech is already above 90%, well above the 60% SUCCEED milestone.

SUCCEED's faculty development model continues to be disseminated at the ASEE Conference. The model has been adopted by all the SUCCEED schools and by the participants Faculty Development Multi-Coalition Conference held in April 1999. Five coalitions were represented, since not all of the coalitions have a faculty development focus. Best practices were summarized in a paper presented at ASEE 1999 and included in the conference proceedings.[33] The model for new faculty support developed by SUCCEED has been being disseminated through workshops and at the 2000 ASEE Conference and an article about it will be included in the conference proceedings.[34]

Nelson Baker of Georgia Tech has been tracking how students are using technology in the classroom as input for FD activities. Two papers were prepared, submitted to and accepted by the ASEE Frontiers in Education Conference (held in Kansas City, MO, Oct 19-21, 2000). The Instructional Objective Writing Assistant (IOWA) website, used to help faculty with

creating good written objectives, is being accessed by many faculty, both at Georgia Tech and from outside of Georgia Tech.[35]

Clemson's College of Engineering and Science has a standing Teaching Effectiveness Committee, chaired by FD Coordinator Doug Hirt.[36] For the past two years, a New Faculty Workshop based on the SUCCEED model was conducted in the form of four afternoon mini-workshops. This year, however, the Dean's office initiated a new orientation program for new faculty in the College. Before classes started in the fall, the Dean spoke about tenure and promotion issues on a Thursday evening, followed by "Orientation to Teaching" Friday morning and "Orientation to Research" Friday afternoon. Debi Switzer (School of Education) and Doug Hirt (Chemical Engineering) conducted the teaching workshop. Clemson has also had several seminars on teaching, has effective links to the university Office of Teaching Effectiveness and Innovation, has instituted several faculty awards for teaching, and has clear standards and expectations for effective teaching as part of the tenure and promotion process.

Faculty development activities at UNC Charlotte have taken advantage of strong linkages to overall university faculty development programs to ensure continuation after SUCCEED funding. Among the achievements are: Faculty Development website—a comprehensive FD website has been created with articles on teaching improvement, teaching assessment, mentoring, peer observation of teaching and evaluation procedures. There are also on-line workshops for teaching observation and creating teaching portfolios; Teaching Evaluation Guidelines created and distributed; strong linkages to overall university activities in faculty development including the university Faculty Center for Teaching; and FD recognition through the establishment of the COE "Celebration of Teaching Day" and awards for excellence in teaching (now funded through the COE). The College of Engineering is currently recruiting for a new assistant dean position that will have faculty development as a major part of the job description.

E. Outcomes Assessment

> ***"We would be eager to learn from SUCCEED's experiences, as shown below."***
> *–from a response to SUCCEED's market survey of US Engineering Deans*

Members of the OA team presented two workshops at the annual SUCCEED conference with many in attendance from Gateway and Foundation Coalition faculty. Members continue to publish and present in assessment conferences and ASEE. Progress was made on the OA Manual. Writing assignments to team members were made with deadlines to finish second draft by August 31, 2001.[37] Two members from different campuses submitted a joint proposal to SUCCEED for a workshop on Trust in the Assessment Process within Engineering Education. Four members from two different campuses plan to write a proposal to NSF for Assessment of Students of Science and Technology.

Sanjiv Sarin of North Carolina A&T helped prepare departments for ABET visits in Fall 2001 using mock ABET visits conducted in March 2001.[38] The seven engineering programs have reported several examples of program improvements based on OA data.[39,40,41] Faculty members at NC A&T recognize the value of OA and the primary role of SUCCEED and OA Task Leader in furthering the cause of OA in the college of engineering.[42,43] A wide variety of sample outcomes assessment documents is available.[44,45,46,47,48,49,50]

SUCCEED has been the catalyst in the creation and implementation of strategic planning and outcomes assessment at UNCC through participation in the College of Engineering SPART team (Strategic Planning and Assessment Resource Team). Among the programs and processes institutionalized are: Annual SPART survey-a survey of approximately 1300 students, 500 employers, 300 alumni and 100 faculty; Annual SPART Assessment Booklet-a publication of all assessment results for the departments and college; Learning Outcomes Database institutionalized in all departments; ICAP (Individual Course Assessment Process)-Adoption of a common template for course assessment by all departments; FAIT (Focus Area Improvement Teams)-departmental groups to guide curriculum improvement and implement change; ASPIRE (Academic Strategic Planning & Institutional Reporting Environment)-WEB based strategic planning software, currently in beta-test phase; FACTS (Faculty Activities Tabulation System)-software WEB-based faculty activities reporting system currently in development; and the SPART Website-library of all OA data and survey results.[51,52,53]

Charles Barron and Marvin Dixon of Clemson have formulated an assessment instrument for use with multidisciplinary design projects. The instrument has been used with one set of students. To expand the testing of the instrument, multidisciplinary design projects were extended to three new sponsors—General Electric Gas Turbine Division, Carolina Filters, and Michelin Tire.[54]

A permanent assessment specialist is now in place to assist all departments at FAMU-FSU. This person is currently assisting all departments with "Alumni Performance Surveys" through a college-level system recently established. An additional higher-level assessment coordinator will be hired by the end of summer 2001. This mirrors efforts that have taken

place or are in progress at other institutions—some of which have been described extensively in earlier reports.

The use of portfolios in the civil engineering program at UF has been evaluated by Gary Consolazio over a several semester period. Web content for a SUCCEED hosted website has been prepared and coordinated with the Office of Instructional Resources (OIR) office at UF and with two other instructors who have used portfolios in their engineering courses. The website is intended to give other instructors general information on the use of portfolios in engineering courses.[55,56,57] Also included on the website are summaries of the experiences (both positive and negative) that the instructors involved in the project have had while using portfolios in their courses. Finally, a first draft of a tutorial on the preparation of web-based portfolios has been prepared. This tutorial will be given to students to help them learn what is necessary to prepare portfolio content in web (HTML) format. A second draft of the tutorial is current being prepared.

Angela Lindner of UF also tested the use of portfolios as outcome measures in her course "Chemistry of Carbon Compounds" (EES4200). The student portfolio used in an organic chemistry course for environmental scientists and engineers proved to be an effective means of a) organizing work in a manner meaningful to each student, b) providing a continuous feedback mechanism, and c) introducing chemistry material with environmental application. The final phase of this work resulted in a written report[58] and the development of a web page and videotaped conference of participating faculty. It was the intent of all participants to broadcast throughout the academic community the benefits of using student portfolios in the engineering classroom.[59]

Joseph Hoey at Georgia Tech has been working on the GT Recruiter survey design and pilot procedures and the co-op survey redesign and pilot procedures. The project resulted in a more effective process for summarizing multiple sources of employer feedback for use in addressing ABET EC 2000 outcomes criteria. Contrasting recruiter estimates of importance with their estimates of the preparation of graduates provided numerous insights on how employers rate GT graduates relative to their needs for human resources. The project resulted in two new instruments that may be used by other interested institutions in pursuing employer feedback in a more systematic manner at their institutions. SUCCEED's support provided the initial impetus to begin what will become a systematic, longitudinal study of employer feedback at GT.[60,61,62] The project has been institutionalized as one of the normal operating procedures within the Office of Assessment at Georgia Tech. Each semester, ratings are received from approximately 175 recruiters and 250 supervisors of co-op students. This sample size permits an in-depth view of student skills. The project will be continued without SUCCEED support. As a result of some of their joint activities, Joseph Hoey and Jack Marr have been invited to the Consortium for Assessment and Planning Support (CAPS) to present workshops on capstone course evaluation and instructional design and evaluation for three years in a row.[63]

ABET's charge to develop "an understanding of professional and ethical responsibility" (Criterion 3f) is one that many schools find difficult to address adequately. Mary Cummings of Virginia Tech is developing a multimedia, online engineering ethics class that fills in this

critical gap and provides students with flexibility in scheduling/class attendance. A draft syllabus has been developed,[64] the required software/hardware for the multimedia portion of the course has been obtained, training to use this technology has begun, website development has been initiated, funding for teaching the class in the fall has been secured, and registration for the Fall 2001 class is underway. SUCCEED's support encouraged the Virginia Tech College of Engineering to provide instructor funding for the Fall 2001 semester and tentatively for future semesters. This on-line approach is most needed to meet the needs of transitioning students, as it is the only vehicle that allows transitioning students to meet ABET requirements.[65]

Jack Elzinga of the University of Florida spearheaded the development of a procedure for holding employer focus groups. This procedure leveraged the efforts of the Career Service Center, and the focus groups were held in conjunction with the "Career Showcase," a forum which attracts nearly all the major employers to the campus. Very successful employer focus groups were held by two departments in September 2000, motivating an initiative to repeat the effort annually. A manuscript describing the efforts and the lessons learned is in development to be submitted for publication. Obtaining Outcomes Assessment data from employers in ABET EC 2000 has been problematical. The return rate on surveys has been low and working with Advisory Boards often misses the people (recruiters) most knowledgeable about company hiring needs and employees' (engineering graduates') performance on the job. The employer focus group activity provides a different perspective from other Outcomes Assessment methods and thereby allows the opportunity for "triangulation."

Efforts toward improving employer feedback processes continue. Mike Leonard of Clemson University presented a workshop entitled "Employer Input for Program Improvement" at the SUCCEED Share the Future II Annual Conference[66] and prepared a manuscript entitled "Gathering Employer Assessment Inputs from Focus Group Sessions with Campus Recruiters." This paper is currently scheduled for publication in the September 2001 issue of the International Journal of Engineering Education.[67] As well, Leonard has continued his efforts to benchmark outcome indicators and assessment processes. He and Eleanor Nault (also of Clemson) prepared a workshop entitled "Assessment: Closing the Loop" for presentation at the Southeastern Region ASEE Conference in Charleston, SC on April 1, 2001.[68,69] He is currently working with SUCCEED OA colleagues at Clemson University and Georgia Tech to prepare a proposal to NSF in response to the RFP "Assessment of Student Achievement (ASA) in Undergraduate Education."

Mike Leonard also developed a process to update program educational objectives using a SWOT analysis of the academic unit and is working to prepare a curriculum review procedure based on revised program educational objectives.[70,71] The program educational objectives revision process has been prepared and tested in the Department of Industrial Engineering at Clemson University, and an approach to curriculum review based on revised program has also been proposed. Remaining project activities in the current year include testing the curriculum review process with Clemson University Industrial Engineering programs, and using both the educational objectives revision process and the new curriculum review process on in one other engineering department at Clemson.

Eleanor Nault shared her expertise on obtaining employer feedback by serving on a discussion panel at SC Association of Institutional Researchers; Focused Discussion Group was the primary example discussed by the panel. Nault and Leonard's work at Clemson is being institutionalized in the College of Engineering and Science through the establishment of a college faculty committee on assessment. By-laws and governance guidelines have been placed in the college. The Director of Assessment (Nault) serves as an ad hoc member to the committee. Programs continue to do their own assessment; however, the Office of Assessment now secures information from alumni rather than each program having to develop alumni surveys. This practice is a clear indicator that the use of alumni data for assessment has been integrated into the institution.

Bevlee Watford at Virginia Tech has also been studying the Employer Feedback process. Employer Focus Groups were held in February and September 2000. Over 75 employers participated providing excellent feedback on the Virginia Tech engineering graduates. Over 75 industry participants have provided their feedback on the quality of our undergraduate students. In conjunction with the CAMEO CareerFest held in February, 5 focus groups were conducted. Graduate students from the psychology department implemented the groups. Their familiarity with assessment and focus group activity made them ideally suited for this activity. In addition to discussion, the employers completed a written survey. A report of the comments made was created and a presentation of the information gleaned from the focus groups was made to College of Engineering Department Heads. Based on feedback from the department heads, a second set of focus groups was conducted in September. The primary changes were to attempt to group the employers by type of engineer hired, and to ascertain if the employer was in fact a supervisor or someone who simply hired the students. Documentation of the process is available.[72]

As part of a comprehensive curriculum renewal, a new sophomore course, ECE220 Analytical Foundations of Electrical and Computer Engineering is being offered for the first time in Spring 2001. The course was developed as an integral part of the new curriculum by Drs. Joel Trussell and Mesut Baran of the ECE department. The course is designed to provide our students the essential mathematical concepts and tools they will need in their studies. Instead of relying on standard service courses offered by the Department of Mathematics, ECE220 is designed specifically for Electrical and Computer Engineers. As such, during the course, students learn how their newly acquired skills apply to practical problems in analysis of signals and circuits. The new sophomore course, ECE200 Introduction to Electrical Engineering Laboratory is being offered for the second time in Spring 2001. Based on the student feedback from the previous semester, the text as well as the experiments have been modified. New experiment hardware to augment one of the experiments is currently under design as a senior design project. The new 4 credit ECE301 Linear Systems will begin in Fall 2001. The work to add new material to the course is in progress. The new 4-credit ECE302 Microelectronics will also begin in Fall 2001. The course will have a new laboratory featuring solid-state devices and electronic circuits.

As of March 2001, Dr. Joni Spurlin joined the OA team as the NC State College of Engineering's new Director of Assessment. She is going to lead the activities related to

analyzing the data collected from the Graduating senior, Alumni, and other surveys. She will provide the much needed bridge between curriculum and outcomes. Several departments collected faculty surveys and analyzed data to observe the coverage of EC 2000 student outcomes in undergraduate courses. A common feature of the collected data was that capstone projects had an unfair load of outcomes where most of the sophomore and junior courses had none. The ECE department is leading the effort in writing course specific instructional objectives with a rotation plan to include some of the student outcomes earlier in the curriculum.

F. Student Transitions

> ***"I have no doubt that [we] would be interested in developing a relationship with SUCCEED. A contact person in the School would need to be identified to coordinate the relationship with you."***
> *– from a response to SUCCEED's market survey of US Engineering Deans*

The University of Florida's Integrated Product and Process Design (IPPD) program,[73] SUCCEED's flagship multidisciplinary design effort, continues to have more project demand than can be satisfied. The 28 program sponsors[74] pay support of $15,000 per project[75] to engage 173 students from 10 disciplines in 31 multidisciplinary capstone design projects.[76] Each design project is aided by a liaison from the company and one of 28 faculty coaches.[77] Since the program's inception, 46 program sponsors have paid a total of $1,995,000 to support 767 students from 10 disciplines engaged in 133 multidisciplinary capstone design projects.[78,79,80] This mutually beneficial university/industry partnership is institutionalized at the University of Florida with approximately 25% of engineering undergraduates participating.

Enrollment in the College of Engineering MAPS (Maximizing Academic and Professional Success) at UNC Charlotte continues to grow, with almost 300 students participating in the fall 2000 semester (a record). One-year and three-year retention rates for students participating in peer mentoring (through the MAPS program) are consistently higher than retention rates for the College of Engineering in general. This is particularly true for women and African American students. The MAPS Program, which includes peer mentoring and SI, is fully institutionalized within the College as evidenced by the fact that three years ago the College hired a full-time, permanent Faculty Associate/Director for the program. The Office of Student Development and Success (OSDS), which houses the MAPS Program, first year programs, experiential learning programs, and other student support services, did not exist prior to SUCCEED. In December 1999, OSDS moved into a new suite of offices that offers student study and meeting spaces as well as office space. The OSDS budget is now a line item in the College's budget (as of 1999-2000).

Virginia Tech's *Introductory Engineering Lab* has undergone significant modifications under the direction of Rich Goff. Prior to this semester, ten laboratory experiences have been created and delivered to over 3000 students. Currently, the investigators from Virginia Tech's Engineering Fundamentals department are delivering eight sections of the laboratory to roughly 250 first year students. As a spin-off of our efforts with the laboratory, hands-on experiences have been incorporated in Virginia Tech's *Introduction to Engineering* course.[81]

Ben Sill's ongoing improvements of Clemson's Introduction to Engineering (ENGR 101) and Introduction to Engineering Problem Solving (ENGR 120) courses were stepped up with the hiring of Matt Ohland, former SUCCEED Assistant Director, as described in more detail in the section on Culture Change. Although the two work closely and openly, Ben retains leadership for the changes made to ENGR 120, whereas Matt has assumed responsibility for the changes to ENGR 101. Some of the changes they would like to make to ENGR 101 are being delayed in favor of adapting the course for participation by the science departments—an outgrowth of Clemson's merged College of Engineering and Science. The acquisition of

new classroom space (upwards of 20,000 square feet over the next two years), Clemson's General Engineering program will be able to introduce hands-on laboratories (similar to those used at Virginia Tech and the University of Maryland) as well as collaborative computer classrooms. The College of Engineering and Science has already spent $50,000 for renovation of the new space, and another $30,000 has been allocated in the present year, including support for the purchase of sensors that allow real-time monitoring of a variety of process variables, enabling students to watch behavior in real-time. The changes to ENGR 101 and 120 affect approximately 700 students each year (ENGR 101 is only offered in the Fall, and Fall enrollment in ENGR 120 is primarily transfer students).

Adding to the already large and growing number of students who have benefited from SUCCEED's freshman year innovations, the University of Florida's Freshman Laboratory was offered in Summer, Fall and Spring, reaching a total of 1060 students in the past year.

UNC Charlotte's Kathleen Nunnally continued her research on student outcomes of Supplemental Instruction (SI). Her research indicates a continued pattern of improvement in academic performance and retention in targeted "gateway" engineering courses at UNC Charlotte. As the table below shows, grades for SI students are higher than the Non-SI population in all but one case, and the Drop/Fail/Withdraw rates are considerably less for the SI population for all courses.[82]

	GRADES		DFW Rates	
	SI	NON SI	SI	Non-SI
CSCI 2215	2.168	2.455	0.00	19.56
EEGR 2112	3.671	2.820	0.00	13.61
EGET 3171	2.507	2.050	18.68	38.16
ESGR2141	2.076	1.934	34.75	51.98
ESGR2144	2.494	2.070	22.63	34.36

A "student expectations" survey was developed and administered to over 150 students in five engineering courses that offer an SI component. Results from this survey are being analyzed. [One notable finding is that the majority of students in high-attrition gateway courses - historically 30% or higher rate of DFW - expect to make A's or B's and study relatively few hours outside class.][83] Four additional courses offered SI components for Fall 2000, taking the total of SI-supported courses to nine (representing 13 sections). Development of SI video marketing/training piece is in progress. Dissemination of SI research has begun through a "Best Practices" conference presentation and through recent submission of a presentation proposal. In collaboration with Charles Price (also of UNCC), electronic SI (eSI) has been implemented for distance learners at two remote sites for a mechanical engineering course. The Fire Safety program began delivery of its first course to NC fire stations as well as the homes of NC firefighters. This program uses Centra 99 as the delivery technology and the classes originate from the new electronic Supplemental Instruction room, which has five multimedia PCs with touch sensitive LCD panels.[84,85,86,87,88,89,90,91]

The UNCC-CIT decided in early, approved strategic planning, that the Student Transitions area would catalyze the greatest support funding from the college and university. This has

proven to be the case, in that almost all of the initial efforts in these two areas have been fully institutionalized. The internal funding has far exceeded that from NSF. Among the programs and processes institutionalized are: Physical Facilities-dedicated areas for 4 offices and 4 student meeting spaces; staff – two positions at 1.0 FTE (full-time equivalent), 3 secretarial positions, 2 student administrative assistants; MAPS (Maximizing Academic & Professional Success) Office-director plus full-time staff established / Resource Library created—this office has created an Assessment Infrastructure to evaluate retention, participation, and grades; SI (Supplemental Instruction)-7 team leaders, funded by COE departments; Student Mentors-12 mentors funded by the College of Engineering; Early Intervention Process-special advising of "at-risk" students; International Internship Program-college funded, fully implemented; Freshman Engineering Program-complete revision of the freshman engineering year curriculum, utilizing SUCCEED input and adapting elements of SUCCEED freshman programs. This includes two new 2-hour courses. Presently affecting about 500 students/year; Freshman FAIT (Focus Area Improvement Team)-a group representing the various departments to guide curriculum development and implementation for the Freshman Engineering Program; a common capstone course among all departments is being created; FE (Fundamentals of Engineering exam) Improvement-A process to improve the participation and pass rate on the FE exam.

Tony L. Mitchell of NC State reports that expansion of mentoring programs (START & WENT) to include all entering freshmen engineering minority students and all women in engineering is proving to be a very popular and effective approach to mentoring.[92,93,94,95,96,97] The summer bridge program held the second summer session 2000 was highly successful, attended by 35 admitted minority students. All but one enrolled as a regular engineering student for fall 2000 academic semester. This academic year, mentors were automatically assigned to each entering minority engineering freshman. In the past, only about 1/3 were assigned mentors. The additional assignments resulted from leveraging the SUCCEED funds to acquire a competitive grant of $150,000 from the Amoco Foundation. The 226 admitted minority students were invited to participate in our 2000 Summer Transition Program. Of those, 43 were accepted and 35 attended. All 35 students who completed the program enrolled as a regular freshman for the fall 2000. The cost of this six-week residency program is still about $2,000 per participant. The minority engineering programs office assumes responsibility for all costs other than those associated with travel to and from NC State.

The programs of Georgia Tech's Office of Minority Education and Development are being reworked under the leadership of Gordon Moore. The CHALLENGE bridge program was expanded to a five-week format (formerly the program was four weeks). Computer Science was added to the summer bridge program curriculum. In addition, computer-based technology was used to teach math. The program is expected to benefit from a technology-based classroom environment, which will be completed before the summer 2001 program. The computer science class that was added to last summer's program is being revamped, and the summer bridge design course is currently being prototyped. A freshmen multidisciplinary design course has been placed in the CHALLENGE program to encourage freshmen participants to work together, and to incorporate their varying technical skills and insights. The end result is a competition at the end of the course, which utilizes whatever was designed by the team. Participation and effort were outstanding. Our corporate partners were

also involved. This effort continues to get a great response from the students. Moore has found the course difficult to run due to the fact that they try to create something new every time. Also, the increasing number of student participants has resulted in increased costs.

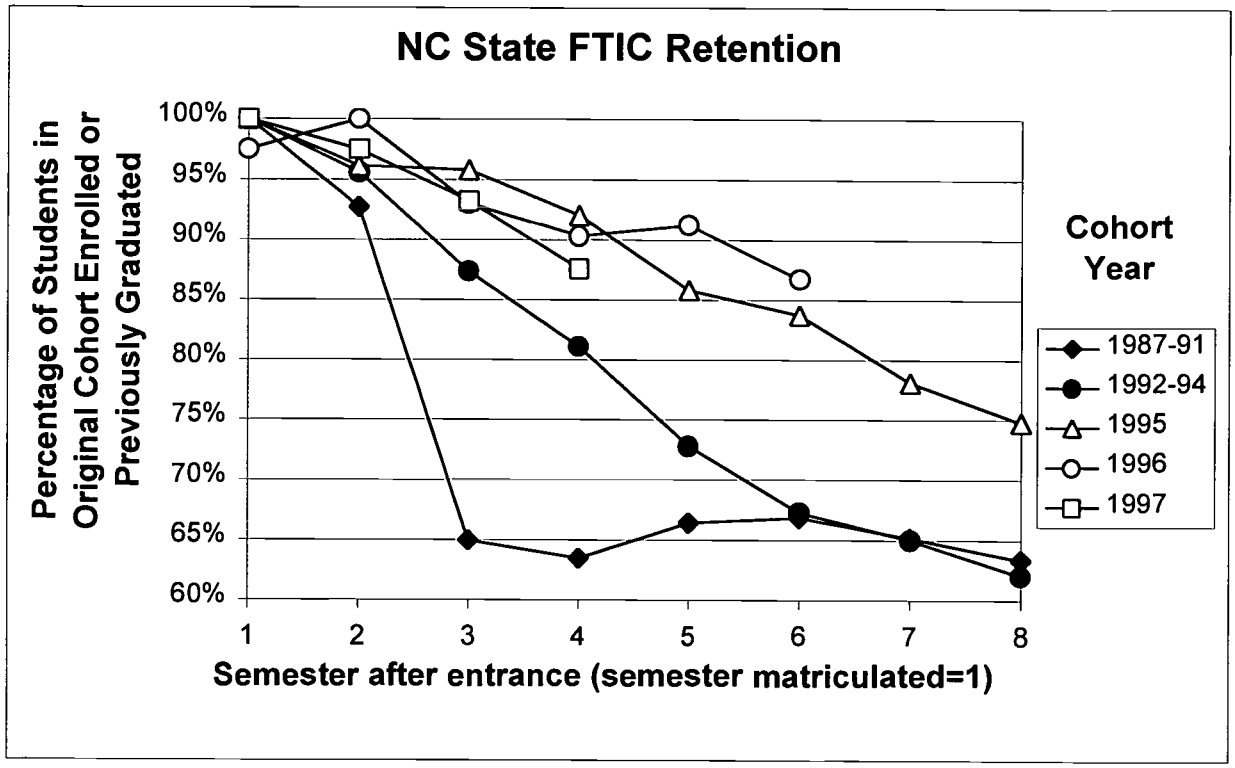
The TRANSITIONS (transfer student bridge) program at Georgia Tech has been expanded to a full week format (formerly the program was 2 days). More time for personal interaction is currently being built into the program. The program will again distribute software bundles to all participants this year. Analysis of the first semester performance of this past summer TRANSITIONS program is in progress. Corporate support has been identified to sustain this work. Moore is also working to integrate both TEAM COACH programs to complete yearlong transitions. The target groups for the Team Coach programs are incoming minority Georgia Tech freshmen and transfer students. One of the Team Coach Programs is considered a major bridge effort for freshman engineering, since most of the Georgia Tech students are in engineering and science. Community college students are included in the other Team Coach program. Mentoring is done with both Team Coach programs through the use of trained upperclassmen, who work with the program participants while in residence during the entire program. The participation levels for these initiatives are off to a great start (over 40%). The performance of the participants is greater than their respective non-participants. These programs keep the students connected, which allows for better monitoring of their progress during the term. Institutionalization is assured because other established institute programs are recognizing this program as a supplemental piece to their efforts, and the institute covers the full time salaries of the program coordinator and the student staff.[98]

Howard Phillips coordinated the Freshman Engineering Programs Best Practices Conference held May 11, 2000 in Charlotte along with the connected Multidisciplinary Design conference.[99] Further outcomes are expected from this work as best practice documents and workshops are created. Phillips and Kathryn Johnson have continued to develop active partners to institutionalize the utilization of the scholarship database.[100]

Siegfried Holzer reports guiding the development of three new pilot courses for Y9-10, and strengthening the Emerging Scholars Program (ESP)-Statics workshops by recruiting one of Virginia Tech's best teachers as an investigator. The three new pilot courses are: Teaching Engineering Ethics by Professor Mary Cummings, Engineering Fundamentals; ESP-Engineering Fundamentals by Professor Mara Knott, Engineering Fundamentals; and Engineering Communications by Eric Pappas, Director MSE / ESM Advanced Engineering Communications Program. Hugh Munson, Professor of ESM, is the new PI for ESP-Statics. He is currently teaching four sections of the ESP-Statics workshops and plans to teach three more in the spring. Assessment and demonstration of student success will be the key to institutionalizing this program. The ESM department head agreed to seek funding from the Dean and the Provost to integrate ESP-Statics into the curriculum if we can demonstrate student success this year.

NC State combined the lessons learned in a number of experimental freshman programs in order to design an new Introduction to Engineering course that was offered to all 1102 freshman engineering students. Students in this course also participate in a study of freshman attitudes. The longitudinal data on NC State's programs demonstrates well the effects of their

cautious approach to making such significant change: in the graph below, the baseline years indicate a rapid drop in engineering student enrollment by the third semester. After SUCCEED researchers began to experiment with improving the curriculum for first-year students, a slight improvement in retention occurred, but at the expense of causing students who would still eventually leave engineering stay longer. The most recent years data appear to show that a much higher retention rate will result once the effects of the new freshman program are observed.



During the summer of 2000, Jeff Connor of Virginia Tech developed a number of mini hands-on design projects. In Fall 2000, five hands-on design lessons were performed in eight sections (250 students) of Virginia Tech's first introduction to engineering class.[101,102,103,104,105] We have conducted a mid-term opinion poll of approximately 400 students not involved in the project and the 250 students in the project to assess the effect of our project on students' learning, understanding, and motivation. We will conduct the same survey at the end of the semester. Preliminary results indicate a positive effect.

A multidisciplinary design workshop for FAMU-FSU College of Engineering faculty was held on August 22, 2000 in Tallahassee. The workshop was organized to give participants an overview of the MD challenge explicit in ABET EC 2000 criteria, to review nine example MD design course or project formats developed at SUCCEED coalition campuses via earlier SUCCEED funding, and to provide each participant a series of MD activities including faculty pairing, project or course conception and need statement, and syllabus development. The workshop participants constituted approximately 15% FAMU-FSU engineering faculty.

At Virginia Tech, James H. Wilson continued Gene Haugh's work using biological systems engineering as the focus of more "real-world" senior design projects and sophomore team design, construction, and testing experiences.[106] While there is still some concern that participation in these early design experiences reduces the number of students available to participate in the vertical design projects (such as Virtual Corporations), the educational experience still has value for the students. The new activities developed for the sophomore Biological Systems Engineering (BSE) course are intended to increase the quality and quantity of the design experiences in the BSE curriculum.

Investigators at NC State received nearly $500K of Action Agenda funding to expand a concept funded as a SUCCEED multidisciplinary design mini-grant.[107] All work for implementing MD is on schedule.

Yousef Haik of the FAMU-FSU College of Engineering has continued his development of the 2400-square-foot Multidisciplinary Design and Training Clinic within the college.[108] The Training Clinic has participation from all five engineering departments, and is included in each department's curriculum. At present there are more than 15 projects running in all five departments. The clinic provides the infrastructure to integrate projects that have roots in industry to courses and capstone design projects, using integrated teams from different engineering disciplines. An infrastructure and foundation space was provided by the College, including basic workspace for four teams to work simultaneously. At present, four student teams are working on industry-sponsored projects, and a staff member has been hired to maintain continuing contact with industry to enhance participation in this project. Industry partners so far have included Cargill, Cummins Engine, and ASHRAE as well as entrepreneurial projects from starting local small business. It is anticipated that the Clinic will lead to the initiation of a product development center. Haik is developing a pilot study of Multiple-teams Multidisciplinary Design Projects (MMP). This pilot study is aimed at enhancing student, faculty and industrial participation in large-scale projects. Each of the MMP projects will involve a team of students that represent a discipline. Three graduate students from the Engineering Management program for each MMP project have been hired to act as project managers for each of the MMP projects, which are worked on by 12-16 students representing all five departments. Both Florida A & M University and Florida State University are supporting this initiative in the college of engineering by waiving the overhead cost for projects under 10k and charge 5% overhead for projects over 10k.

Robert Fornaro[109] and Steve Peretti[110] of NC State coordinated a multidisciplinary student team of chemical engineers and computer scientists[111] using an approach that integrated teaming,[112,113] professional communication, and product development processes in a multidisciplinary environment.[114] The students successfully completed a project to develop a facility to manufacture citric acid and a corresponding computer-based Manufacturing Execution System.[115] Results of the multidisciplinary team experiment were collected by examining modes and effectiveness of communication within the student team. Faculty and industrial mentors were assigned to the team to provide technical consultation. Students were charged with the responsibility to communicate requirements and to evaluate prototype components built by their discipline-specific counterparts.[116]

William O'Brien is conducting a course in Spring 2001 that is offered jointly with the University of Illinois at Urbana-Champaign and has established a teaching lab related to the course.[117] Teaching an experimental section demonstrated that students can effectively create work flow/process critiques along with designs in this course in which students work in multi-disciplinary teams of Architects, Structural Engineers, and Construction Engineers to complete a traditional engineering design project.[118] Students are also successful in redesigning the work process taking advantage of new computer tools.

Samuel Owusu-Ofori continued his work on providing a multidisciplinary capstone design experience for students at North Carolina A&T. He has created an interdisciplinary design team experience for mechanical and electrical engineering students in which students obtain experience in product and process design, and system integration and realization of an electromechanical system and improve their ability to communicate both orally and written, understand ethical and professional responsibility. Eight electrical engineering and three mechanical engineering students were selected to participate in the project. The team was subdivided into two functional groups; namely, electromechanical group and electronics group. The electromechanical group consisted of four electrical and three mechanical engineering students. The electronics group consisted of four electrical engineering students. The entire team came up with the general design concept of the system and each group was given the subtask of working out the details.[119,120]

Clemson's FIRST CLASS (FIRST for Freshmen, CLASS ~ Community for Learning And Student Success) learning community was initiated in Fall 2000 semester. The program occupies two floors of a dorm (61 students)—one floor of males, one floor of females; demand for the program far outstripped the space available. Students are scheduled in cohorts (in up to four of their classes), and the lounge in their dorm has been modified with computers, printer, etc. for team assignments. Initial reports from students are that the ability to live together and attend the same sections of classes is helping in their transition to college life. A variety of quantitative and qualitative assessments are underway. The General Engineering Program has hired a full-time Recruiting and Retention specialist who is overseeing this program. The dorm is being shared with the College of Business and Public Affairs who are the other participants in FIRST CLASS. In the spring, a new cooperative course is being offered that will require the engineering students to design, construct and operate an engineering project. Business students will be required to develop a marketing plan and for this product. Teams of four will be comprised of two engineering and two business students. Sixty students have enrolled for this course.

G. Technology-Based Curriculum Delivery

> ***"I have completed the short survey below. As you can see, [we] would be interested in all of the topics that you've listed."***
> *– from a response to SUCCEED's market survey of US Engineering Deans*

Georgia Tech hosted the 25th annual summer institute for the Southeastern Consortium for Minorities in Engineering (SECME).[121] Each participant in the summer institute received a copy of the Effective Teaching with Technology workshop handout. This summer institute, which helps K-12 teachers to prepare future engineers, has been hosted previously by the University of Florida.[122]

The Visualizations in Materials Science CD-ROM product that has been the subject of earlier dissemination study survived a publisher transition. Since the courseware was very successful, John Russ (of NC State, the courseware author) has worked out an arrangement with a publisher to make it available at a minimal cost (~$38). Only the PC version is available at this time. Information on the CD (ISBN 0-534-95736-6 [Windows version]) is available from the publisher, Brooks-Cole Publishing.[123]

John Gowdy of Clemson University led a project to offer at least one course involving shared faculty expertise across the SUCCEED institutions. He developed four new computer simulation modules to support a course taken via distance learning and led an investigation into effective hardware and software resources for teaching a course over the Internet via video streaming along with other material. While SUCCEED's mission is to better the education of the undergraduate, it was decided that it would be safest to pilot this approach in a graduate level course—ECE 846 – Digital Processing of Speech Signals. The ultimate product of the work will be presenting six lectures to students at another university, then evaluating the feedback from students.

UF has a complete technology infrastructure that supports the students and faculty for all aspects of the educational process. Students and faculty have universal accounts that provide e-mail, access to their own student records, authentication for access to other support services. The college of engineering has a laptop requirement for all engineering students starting fall 2001. The university has provided laptops and training to many faculty free of charge. WebCT is available to faculty members for use with their course. Training is available in the use of technology in topics like web page development, streaming media, and many more. SUCCEED funds supported four mini-grants for faculty to incorporate the use of laptops into their course, offered a distance multidisciplinary design course in conjunction with University of Illinois at Champaign-Urbana in Civil Engineering Construction, and developed and tested a wireless classroom; funding is being sought to bring wireless to more engineering classrooms.

Laurie Sherrod and Bill Moss continue to manage Clemson's pilot laptop program and WebCT coordination, respectively.[124] Sherrod gives workshops on laptop support[125] and care[126] to a pilot implementation of laptop usage in preparation for a laptop mandate, which will be proposed to the College of Engineering and Science board of trustees this summer.[127,128] This proposal will specify that all freshmen and sophomores, beginning in

2002, will be required to have laptop computers. Student technology expertise has grown from the use of laptop computers. Improved teaching methods and improved learning have resulted from the laptop classes provided for by the pilot study.

Moss conducted a January workshop to train mathematical science faculty using WebCT to manage multiple sections of a course. Moss also reported on the Respondus software for making WebCT quizzes; Respondus is a (math) quiz authoring and management product that works with WebCT. Moss beta tested the product, worked with the developer to make some improvements, and then reported on his findings to faculty who will find this product useful. Moss also provides access, consulting, and training to faculty who want to use Clemson's Real server[129] or Quicktime server.[130] Using Camtasia, Moss created a series of "Video Tutorials" for WebCT in Windows Media Video format. These tutorials represent a technology break-through in the area of low bandwidth transmission of video.[131] Moss' helpful suggestions for using a WebCT server can be found on the web,[132] as well as an account of the continuing exploration to extend the benefit of the use of these technology tools.[133]

Glenda Scales of Virginia Tech is coordinating an effort to assist faculty in creating instructional web presence for sophomore and junior level courses. This will require a central place for course information, including sample assignments and tests for each course. The project is in the initial stage with review in progress of the survey instrument to be used to gather data from the faculty. Preliminary design concepts have been completed and production has begun to create the working model. Scales anticipates having 50 - 60 % of the courses online by May 4, 2001 and the remainder completed by July 1, 2001. This is expected to be a resource for anyone interested in the undergraduate or graduate engineering curriculum at Virginia Tech, as it will give a representational snapshot of each course's content and workload.

At UNC Charlotte, an Internet-based classroom space was dedicated for distance learning, and the budget was shifted to the College of Engineering. In addition to the Fire Safety curriculum mentioned earlier, an RF-Communications course was delivered by distance learning to Council of Schools partner Mississippi State University.

Virginia Tech's efforts in technology-based curriculum delivery (TBCD) are coupled to efforts in faculty development—including developing a partnership with the University's Faculty Development Institute (FDI), which assists faculty to improve teaching and learning through the use of technology. The FDI presents a three-day workshop in the summer and twenty discipline-specific workshops on advanced topics during the academic year; status of individual TBCD projects is described in PI progress reports.

Jim McClellan of Georgia Tech has continued his work evaluating streaming media for distance learning. He has found that a streaming media creation tool simplifies the rapid development of high-quality computer-based presentations, and requires only a laptop and camera. New course material is being produced and used on-line in a large sophomore course by students in Atlanta and also in South Georgia. The evaluation task requires that we build a library of video material that can be used by students. This is underway in a large

introductory course, because faculty now have several tools at their disposal for easy and quick creation of this material. Numerous animations and demos continue to be produced by graduate students as software developers. McClellan has also worked to increase the participation of faculty that exploit computer and communication technology. The ECE Computer-Enhanced Education (CEE) group continues to grow with more faculty using streaming media and other tools in their courses. Wider use of McClellan's streaming media course creation tool will be starting this summer term with faculty in other departments at Georgia Tech.[134] McClellan is recruiting faculty from other departments to use this tool for their own courses, as part of a larger GT development effort. SUCCEED is supporting a crucial part of the development as we try to make this tool easier to use and more stable for a variety of platforms and external users.

H. Culture Change

The Dissemination section usually included here is omitted; changes in our organization (described in the Strategic Plan) ensure that dissemination is completely integrated into what we do in SUCCEED. This section on culture change is included because some significant indicators of culture change have been observed at SUCCEED institutions in the past year.

> ***"Thanks for your input on the various computer lab configurations. I believe the collaborative learning environment issue was a selling point."***
> *– regarding the use Siegfried Holzer's cooperative learning experiences as a basis for designing Virginia Tech's Civil and Environmental Engineering Computer Lab. The design received a $50,000 award from Virginia Tech and $200,000 in alumni contributions to support remodeling the lab.]*

At the review of SUCCEED's proposal to continue the work of the Coalition with another 5-year cooperative agreement, the most outstanding indicator of culture change was described by Jack Lohmann of Georgia Tech. He gave an account of how Kurt Gramoll had been promoted and granted tenure in large part because of his outstanding work in educational software. The panel found it compelling that we could provide such an example where research with an educational perspective not only did not hinder a tenure candidate, but actually helped make the faculty member's case stronger. While not minimizing the importance of that milestone, Clemson University has taken the next step toward changing the culture by hiring a tenure-track faculty member who is specifically encouraged to specialize in engineering education research.

A position was advertised in Clemson's General Engineering program in the spring of 2000. The announcement reads, "The College of Engineering and Science at Clemson University invites applications for a faculty position in the General Engineering Program starting in August, 2000... the appointment may either be as Assistant Professor (tenure track) or as Lecturer... Duties will include teaching, program development, and student advising and recruitment. Appointment to a tenure track position carries expectations of accomplishment in scholarship (research and publication). In General Engineering, the primary focus of scholarship would be on engineering education." Matthew Ohland, who had been the Assistant Director of SUCCEED since receiving his doctorate from the University of Florida in 1996 (focusing on engineering education research), was hired for the position, although there were other strong applicants with an interest in engineering education research. Clemson hopes that Dr. Ohland's career will help establish educational research as a viable research specialty within engineering. While this career path was not inconsistent with the existing guidelines for Promotion and Tenure, a set of guidelines explicit to the General Engineering and Engineering Graphics programs was established to clarify the nature of the position.[135]

At Georgia Tech, a committee of students, staff, and faculty was formed to study teaching quality at the initiative of some of students—this committee has had a significant effect this year on TA issues.[136] More detail is available in the Center for the Enhancement of Teaching and Learning's newsletter, which is published every semester.

I. Assessment

> ***"We have followed the SUCCEED program closely over the past three or four years (as we have the other NSF Coalition programs), obtained your CD-ROMs, and visited your website to obtain information. All of the items that could be checked in your survey are of interest to us, as we have initiatives in virtually all of those areas. We would be pleased to have a continuing relationship with the SUCCEED program."***
> *– from a response to SUCCEED's market survey of US Engineering Deans*

The analysis of the 1999 Faculty Development/Teaching Practices survey is ongoing. The data from this administration will be compared to the data from the 1997 administration.[137]

Investigators at UNC Charlotte have met with Bob Serow (who is responsible for the qualitative assessment of SUCCEED) and discussed the overall Coalition assessment effort in an attempt to ensure that the two assessment efforts are complementary. They have also discussed a possible collaboration involving a triangulation methodology. UNCC investigators plan to interview key individuals in the College and SUCCEED as part of a qualitative assessment of the impact of SUCCEED, especially on the culture of the college and particular initiatives having lasting effects on the college and the university. They will also conduct a quantitative analysis using the extensive database established by the SUCCEED-supported initiatives of SPART, MAPS, ASPIRE, and FACTS, as well as the coalition-wide longitudinal database developed by SUCCEED.

Matthew Ohland secured the release of a number of corrections to the Longitudinal Database, including baseline information from the Florida Board of Regents (previously missing), corrected cumulative GPA and cumulative hours data from Clemson University, missing graduation data from Clemson University, and missing terms from North Carolina A&T. These corrections, along with the release of data updates from each of SUCCEED's nine institutions are being incorporated. In order to make the database more accessible to SUCCEED faculty, Ohland developed a "Using the SUCCEED Longitudinal Database" handout,[138] which has the layout of the database fields on the back.[139] He also developed and maintains a list of ongoing studies.[140] A cover article was written for the upcoming issue of SUCCEED's Innovator; this article both informs the SUCCEED investigators about the LDB project and illustrates how they can use the LDB in their own research. This solicitation is expected to elicit more data for analysis.

In spite of the fact that corrections to the database were needed to make it more robust, some significant studies made progress. The study of the NC State FTIC engineering cohorts was presented to the Deans and the External Advisory Board at meetings in March,[141] and will be presented at ASEE 2001.[142] The baseline data from the Florida BOR will permit completion of the study of the FAMU-FSU ECI program for publishing in an archival journal. A precursor to this archival paper was presented at the FIE 2000 conference.[143,144] Ohland recently received the approval of Clemson's Institutional Review Board for this work, as well as the endorsement of SUCCEED's Deans Council and External Advisory Board. Database operations were temporarily halted due to a disk failure, but no data was lost, and the database is again fully operational.

Matthew Ohland has developed a workshop based on the Evaluation and Assessment Primer developed by Neff Walker of Georgia Tech sponsored during SUCCEED's first award.[145] The workshop received among the highest ratings of any of the workshops at the recent Share the Future II conference.[146] This workshop will be among those offered during the "Coalitions Day" organized by SUCCEED at the upcoming ASEE Annual Conference.

Following completion of the second full cycle of qualitative campus assessment studies and publication of their reports, plans for creating a Final Qualitative Summary Report were developed and proposed.

The A&E team has been accumulating data on enrollment and graduates in engineering by totals, men, women and minorities going back to 1989. This activity will be continued through the remainder of the project. This database on engineering enrollment and graduates for SUCCEED schools and remainder of U.S. was updated with 1999-2000 information from the latest AAES Manpower reports. A study of the percentage of engineering students enrolled in U.S. engineering colleges (excluding coalition participants) by decreasing size of total enrollments was conducted.

J. Industrial Involvement

SUCCEED continues to have a wide variety of industrial involvement—through program (and Coalition) evaluation/advisory roles, through direct financial support, and through contact with our students. Mentoring is the most active of these, usually incorporating some element of the advisory/support role. In cases where direct financial support is provided as a grant, and there is no additional industrial interaction, that support has been listed in the "Follow-on funding" section of Major Accomplishments, and this section is reserved for support that is accompanied by a relationship with an industrial partner.

Program evaluation/advising

SUCCEED's EAB continues to play a more active role than is typical of such bodies. Each member serves both the Coalition as a whole and one focus area in particular in an advisory capacity. This closer relationship with the focus area within their expertise has tapped the expertise of our EAB in the process of design and implementation. This interaction has continued to be most significant in the OA area. In the past year, EAB input and influence was invaluable in the construction and testing of an employer feedback instrument and process.

Mentoring/Consulting to students or teams

This section includes pertains to industrial involvement of a mentoring/consulting nature. While support level is included where the mentoring was accompanied by financial support, these figures do not include estimates of the value of the industry employee's time.

Activity supported	Supported by	Support level if available
Cost estimating and ethics lectures at UNC Charlotte	local business professionals	
NC State Women's E-mail Corporate Mentoring Program	33 mentor/mentee pairs have been connected	
UF Integrated Product and Process Design	In addition to mentoring student teams, each of 28 companies contributes $15,000 per project (31 projects in all) to offset program expenses. There is a long list of past sponsors and potential sponsors for future projects.[147]	$1,995,000 since program inception
"Automated Orientation Device to enhance the production of automotive tubeless tire valves"	Schrader-Bridgeport	$9,800

Activity supported	Supported by	Support level if available
Clemson Engineering Program for International Careers (EPIC)	48 students placed with 11 companies 48+ domestic and 41 international internships (many students do 2 domestic internships)	$835,000
UNCC Mechanical/Electrical Engineering joint project	Caterpillar	$10,000
UNCC "An Emergency Medical Device to stabilize a fractured pelvis"	Carolinas Medical Center	$14,800
UNCC "Search and Discovery Tools in Intranet Environments"	First Union	
UNCC "Establishing Effective, Multi-University, Student Teams for Addressing Interdisciplinary Projects"	Ryobi, Torrington, Michelin, GE, Carolina Filter, and Alcoa Fujikura, Ltd.	
UNCC "Design and Manufacture Components for an Electric Golf Cart"	DAA	$76,000

K. Budget Information

This section includes a detailed description of allocations for the period September 1, 2000 through August 31, 2001, referred to as "Year 9" or "Y9." Also included in this section is an itemized budget request for the period September 1, 2001 through August 31, 2002 ("Year 10" or "Y10").

Funding was provided to the participating institutions by subcontracts for the annual period September 1, 2000 through August 31, 2001 of the cooperative agreement between the NSF and SUCCEED. The work to be performed under these subcontracts is a series of specific tasks. Each task is identified by a specific work statement under management by a designated principal investigator (PI). Each participating institution is required to specify a matching amount of cost sharing approved by the responsible institutional fiscal officer. Detailed budget allocations and matching funds for Year 9 follow.

This section includes a verification of cost sharing signed by each of the participating institutions for the time period July 1, 1997 through January 31, 2001.

These budget pages are replete with acronyms in order to avoid smaller print—please refer to Appendix I for a complete set of definitions.

SUCCEED YEAR 9

BUDGET ALLOCATED BY TASK (as of 4/30/01)

School	Total	CIT TEAMS	DISSEMINATION TEAM	FD CFT	OA CFT	MD-ST CFT	TBCD CFT	A&E CST	ST-Fresh. Programs
CLEMSON	$ 237,823	$ 165,285	25,538	15,000	20,000	0			12,000
FAMU	$ 70,000	$ 70,000				0			
FSU	$ 90,000	$ 80,000				10,000			
GEORGIA TECH	$ 257,941	$ 208,940		15,000	22,000		12,001		
NC A&T	$ 170,000	$ 150,000			10,000	10,000			
NC STATE	$ 468,849	$ 210,000	52,938	110,564		57,478		37,869	
UNCC	$ 270,590	$ 150,000	96,590			18,000			6,000
VIRGINIA TECH	$ 288,645	$ 209,999		15,000	35,646		22,000		6,000
UF	$ 369,889	$ 210,000	107,099	6,800	11,972			22,018	12,000
-ADMIN.	$ 250,967								
-RESERVE	$ 35,000								
s/t	$2,509,704	$ 1,454,224	$ 282,165	162,364	99,618	95,478	34,001	59,887	36,000
DT Workshops	27,604								
TOTAL PLANNED	2,537,308								

SUCCEED YEAR 9 - BUDGET ALLOCATION STATUS AS OF 4/30/01

SCHOOL	Task	PI	Approved NSF Funds		Match Promised
UNCC	CIT Team	Coleman	150,000		151,310
	DT-CST	Coleman	96,590		15,704
	ST-MD CFT	Coleman	18,000		60,678
	ST - Fresh CFT	Tolley	6,000		6,002
		s/t	270,590		233,694
Va Tech	CIT Team	Holzer	190,000		207,343
	CIT - Assessment	Scales	19,999		20,007
	FD CFT	Holzer	15,000		0
	OA CFT	Kurstedt	35,646		20,417
	TBCD CFT	Tront/Lockhart	22,000		22,000
	ST-Fresh CFT	Watford	6,000		6,000
		s/t	288,645		275,767
UF	Admin	Anderson	250,967		0
	CIT Team	Holt	210,000		649,071
	OA CFT	Legg	11,972		0
	DT CST	Anderson	33,894		54,477
	ST CFT(Fresh)	Earle	12,000		0
	DT CST	Holt	80,005		0
	A&E CST	Anderson	22,018		0
		UF S/T	620,856		703,548
				% Allocated	
	TOTAL ALLOCATED		$2,474,704	98%	$2,571,371
	RESERVE Y9 Dissemination	Zorowski	27,604		
	RESERVE Y9	Anderson	35,000		
			$2,537,308		
	TOTAL NSF BUDGET Y9		$2,500,000		
	RESERVE Y8 Dissemination		37,308		
			$2,537,308		

SUCCEED YEAR 9 - (Period: September 1, 2000 through August 31, 2001)

FUNDS OBLIGATED / UNOBLIGATED
STATUS AT APRIL 30, 2001

OBLIGATED		
SUBCONTRACTS - TEAMS FUNDING	**$**	**1,853,848**
UNIVERSITY OF FLORIDA TEAMS	**$**	**369,889**
UNIVERSITY OF FLORIDA ADMIN	**$**	**250,967**
	$	**2,474,704**
UNOBLIGATED (as of 4/30/01)	**$**	**27,604**
RESERVE	**$**	**35,000**
TOTAL NSF FUNDS AWARDED YEAR 9	**$**	**2,500,000**

VERIFICATION OF COST SHARING

CLEMSON UNIVERSITY	$ 898,967.64
FLORIDA A&M UNIVERSITY	$ 189,673.64
FLORIDA STATE UNIVERSITY	$ 155,121.56
GEORGIA TECH	$ 369,712.61
NORTH CAROLINA A&T UNIVERSITY	$ 661,558.00
NORTH CAROLINA STATE UNIVERSITY	$ 1,317,558.00
UNIVERSITY OF NC - CHARLOTTE	$ 876,684.37
UNIVERSITY OF FLORIDA	$ 2,932,934.00
VIRGINIA TECH UNIVERSITY	$ 1,269,031.26
sub-total	$ 8,671,241.08
Council of Schools:	
MISSISSIPPI STATE UNIVERSITY	$ 1,580.18
SOUTHERN ILLINOIS UNIVERSITY	$ 8,344.38
TOTAL	$ 8,681,165.64

(signed verification forms follow)

Curriculum 21
SUCCEED

Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

CLEMSON UNIVERSITY

The Cost Sharing provided as of 3/16/01 for the time period 7/1/97 through 12/1/00 is:

Cumulative Cost Sharing

$898,967.64

Verified: Roberta H Elrod

Clemson University Sponsored Programs
Accounting and Administration

4/9/01

Curriculum 21
SUCCEED

Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

FLORIDA A & M UNIVERSITY

The Cost Sharing provided as of 3/15/01 for the time period 7/1/97 through 3/15/01 is:

Cumulative Cost Sharing

$189,673.64

Verified: _____

Florida A&M University
Office of the Controller

4/9/01

Curriculum 21
SUCCEED

Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

FLORIDA STATE UNIVERSITY

The Cost Sharing provided as of 3/16/01 for the time period 7/1/97 through 1/31/01 is:

Cumulative Cost Sharing

$155,121.56

Verified: _____

The Florida State University
Contracts & Grants

4/9/01

Curriculum 21
SUCCEED

Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

GEORGIA TECH

The Cost Sharing provided as of 3/15/01 for the time period 7/1/97 through 1/31/01 is:

Cumulative Cost Sharing

$369,712.61

Verified: _____
Georgia Tech
Grants & Contracts Accounting

4/9/01

Curriculum 21
SUCCEED

Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

NORTH CAROLINA A&T STATE UNIVERSITY

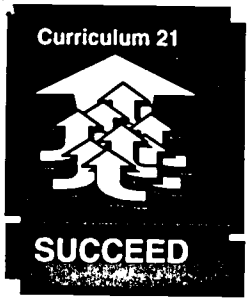
The Cost Sharing provided as of 3/15/01 for the time period 7/1/97 through 12/31/00 is:

Cumulative Cost Sharing

$661,558.00

Verified: Lavonne Matthews 4/12/01
North Carolina A&T State University
Office of Contracts & Grants

4/9/01



Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

NORTH CAROLINA STATE UNIVERSITY

The Cost Sharing provided as of 3/15/01 for the time period 7/1/97 through 1/31/01 is:

Cumulative Cost Sharing

$1,317,558.00

Verified: _____

North Carolina State University
Office of Contracts & Grants

4/9/01

Curriculum 21
SUCCEED

Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

The Cost Sharing provided for the time period 7/1/97 through 3/30/01 is:

Cumulative Cost Sharing

$876,684.37

Verified: Sharon L. Kisack
University of North Carolina at Charlotte
Financial Services/Sponsored Programs

4/9/01

Curriculum 21
SUCCEED

Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

UNIVERSITY OF FLORIDA

The Cost Sharing provided for the time period 7/1/97 through 3/1/01 is:

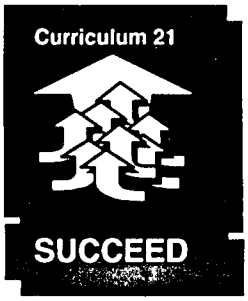
Cumulative Cost Sharing

$ 2,932, 934.00

Verified: _____

University of Florida
Fiscal & Personnel Office

4/9/01



Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

VIRGINIA POLYTECHNIC INSTITUTE & STATE UNIVERSITY

The Cost Sharing provided as of 3/15/00 for the time period 7/1/97 through 1/31/01 is:

Cumulative Cost Sharing

$1,269,031.26

Verified: _____ 3/29/01

Virginia Tech State University
Office of Sponsored Programs

4/9/01

Curriculum 21
SUCCEED

Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

MISSISSIPPI STATE UNIVERSITY

The Cost Sharing provided as of 11/3/00 for the time period 7/1/97 through 11/3/00 is:

Cumulative Cost Sharing

$1,580.18

Verified: Denise Peppler

Mississippi State University
Office of Sponsored Programs

4/9/01

Curriculum 21
SUCCEED

Southeastern University and College Coalition for Engineering Education

University of Florida
P. O. Box 116134
Gainesville, FL 32611-6134

Telephone: (352) 392-4100
Facsimile: (352) 392-4126
E-mail: succeed@che.ufl.edu

VERIFICATION OF COST SHARING
SUCCEED COALITION

SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE

The Cost Sharing provided as of 3/15/01 for the time period 1/1/00 through 8/31/00 is:

Cumulative Cost Sharing

$ 8,344.38

Verified: Jeff Tally 4/13/01

Mr. Jeff Tally, Supervisor
Research & Projects Fiscal Management
Southern Illinois University at Carbondale

4/9/01

SUMMARY PROPOSAL BUDGET

YEAR 10 (9/1/01-8/31/02)

FOR NSF USE ONLY

ORGANIZATION	PROPOSAL NO.	DURATION (MONTHS) Proposed	Granted
UNIVERSITY OF FLORIDA			
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR	AWARD NO.		
DR. TIMOTHY J. ANDERSON			

A. SENIOR PERSONNEL: PI/PD. Co-PIs, Faculty & Other Senior Associates (List each seperately with title; A.6. show number in brackets)	SUCCEED Funded Person-mos. CAL	ACAD	SUMR	SUCCEED Funds Requested By Proposer	Funds Granted By NSF (IF DIFFERENT)
1. T. J. ANDERSON - DIRECTOR	4	0	0	52,054	$ 0
2.	0	0	0	0	0
3.	0	0	0	0	0
4.	0	0	0	0	0
5.	0	0	0	0	0
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)	0	0	0	0	0
7. ( ) TOTAL SENIOR PERSONNEL (1-5)	4	0	0	52,054	0
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. ( ) POST-DOCTORAL ASSOCIATES	0	0	0	0	0
2. ( ) OTHER PROFESSIONALS	0	0	0	0	0
3. (4) GRADUATE STUDENTS				72,000	0
4. ( ) UNDERGRADUATE STUDENTS				0	0
5. ( ) SECRETARIAL-CLERICAL	12			23,000	0
6. ( ) OTHER (Res. Coord.) + Mentors/Tutors	12			55,000	0
TOTAL SALARIES AND WAGES(A+B)				202,054	0
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				33,326	0
TOTAL SALARIES, WAGES AND FRINGE BENEFITS				235,380	0
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000:)					
TOTAL PERMANENT EQUIPMENT Funds Requested from NSF				5,500	0
E. TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				48,000	0
2. FOREIGN (ICEE)				10,000	0
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ 0					
2. TRAVEL 0					
3. SUBSISTENCE 0					
(0) TOTAL PARTICIPANT COSTS				0	0
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				24,500	0
2. PUBLICATION COSTS / Documentation / Dissemination / Final reporting costs				22,020	0
3. CONSULTANT SERVICES				0	0
4. COMPUTER (ADPE) SERVICES				0	0
5. SUBCONTRACTS				1,944,530	0
6. OTHER (INCL FOOD COSTS $5,000, TUITION X 4 - 274/MO X 10 M, 302/MO X 2M =$13376)				41,000	0
TOTAL OTHER DIRECT COSTS				2,032,050	0
H. TOTAL DIRECT COSTS (A THROUGH G)				2,330,930	0
I. INDIRECT COSTS (SPECIFY RATE AND BASE) 46% MTDC (-d, -g5, -tuition)					
TOTAL INDIRECT COSTS				169,070	0
J. TOTAL DIRECT AND INDIRECT COSTS (H+I)				2,500,000	0
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPM 252 AND 253)				0	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 2,500,000	$ 0

M. COST SHARING: PROPOSED LEVEL 2,500,000	AGREED LEVEL IF DIFFERENT $	
PI/PD TYPED NAME & SIGNATURE* Dr. Timothy J. Anderson Timothy J Anderson	DATE 4/13/01	FOR NSF USE ONLY
INST. REP. TYPED NAME & SIGNATURE*	DATE	INDIRECT COST RATE VERIFICATION: Date Checked / Date of Rate Sheet / Initials-DGC

SUCCEED YEAR 10 - PERIOD: Sept. 1, 2001 through AUGUST 31, 2002

PROPOSED BUDGET BY MAJOR AREAS

CAMPUS IMPLEMENTATION TEAMS	$	1,450,000
-ASSESSMENT & EVALUATION	$	100,000
DISSEMINATION TEAM	$	190,000
- FACULTY DEVELOPMENT CFT - OUTCOMES ASSESSMENT CFT - STUDENT TRANSITION CFT - TECHNOLOGY BASED CURRICULUM DELIVERY CFT	$	510,000
ADMINISTRATION	$	250,000
PROPOSED NSF TOTAL BUDGET	$	2,500,000

Appendix I. Glossary of Acronyms

SUCCEED	Southeastern University and College Coalition for Engineering Education

SUCCEED's institutions

Ga Tech, Georgia Tech, GT	Georgia Institute of Technology
FAMU	Florida A&M University
FSU	Florida State University
NCAT, NC A&T	North Carolina A&T State University
NC State, NCSU	North Carolina State University
UF	University of Florida
UNC C, UNCC, UNC-C	University of North Carolina at Charlotte
Va Tech, Virginia Tech, VT,	Virginia Polytechnic Institute and State University

SUCCEED personnel and affiliates

CFT	Coalition Focus Team
CIT	Campus Implementation Team
CST	Coalition Service Team
COS	Council of Schools
PI	Principal Investigator
EAB	External Advisory Board

SUCCEED focus areas

FD	Faculty Development
OA	Outcomes Assessment
ST	Student Transitions
TBCD	Technology-Based Curriculum Delivery

SUCCEED Council of Schools members

PUPR	Polytechnic University of Puerto Rico
SIUC	Southern Illinois University at Carbondale
UPR	University of Puerto Rico (Mayaguez)
MSU	Mississippi State University

Organizations, administrative units, and conferences

AAES	American Association of Engineering Societies
ABET	Accreditation Board for Engineering and Technology
ASEE	American Society of Engineering Education
EC 2000	Engineering Criteria 2000
CES	College of Engineering and Science (at Clemson)
COE	College of Engineering
FIE	Frontiers in Education Conference
ICEE	International Conference on Engineering Education
NSF	National Science Foundation

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